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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Karl M. Robinson

Title: DEVICES HAVING IMPROVED CAPACITANCE AND METHODS OF THEIR FABRICATION

Docket No.: 303.455US3

Serial No.: 09/470,265

Filed: December 22, 1999

Due Date: N/A

Examiner: Unknown

Group Art Unit: 2811

Assistant Commissioner for Patents  
Washington, D.C. 20231

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MAY 15 2000

TECHNOLOGY CENTER 2800

We are transmitting herewith the attached:

☒ Communication Re: Incorrect Filing Receipt (1 pg.)

☒ Copy of Filing Receipt (1 pg.)


☒ A return postcard.

☒ Copy of first page of Patent Application (1 pg.)

No Additional fee is required.

CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this Transmittal Letter and the paper, as described above, are being deposited in the United States Postal Service, as first class mail, in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231, on this 2<sup>nd</sup> day of April, 2000.

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By:   
Name: Allen J. Oh  
Reg. No. 42,047  
AJO:CMG:clh

S/N 09/470,265

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Karl M. Robinson Examiner: Unknown  
Serial No.: 09/470,265 Group Art Unit: 2811  
Filed: December 22, 1999 Docket: 303.455US3  
Title: DEVICES HAVING IMPROVED CAPACITANCE AND METHODS OF  
THEIR FABRICATION

COMMUNICATION RE: INCORRECT FILING RECEIPT

Assistant Commissioner for Patents  
Washington, D.C. 20231

Applicants hereby request correction of the Filing Receipt with respect to the above-identified patent application. In the Corrected Filing Receipt received April 13, 2000, (copy enclosed), the Title is still incorrect. The Title reads: **DEVICE HAVING IMPROVED CAPACITANCE AND METHODS OF THEIR FABRICATION**. It should read: **DEVICES HAVING IMPROVED CAPACITANCE AND METHODS OF THEIR FABRICATION**. This is evidenced by the first page of the Patent Application (copy enclosed).

Applicant would appreciate the above-identified printing error be corrected and that a new "corrected" filing receipt be sent to Applicant's representatives at the address given below.

Respectfully submitted,

KARL M. ROBINSON

By his Representatives,

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Date April 27, 2000

By [Signature]

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I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to Assistant Commissioner of Patents, Washington, D.C. 20231, on April 27, 2000.  
Date of Deposit

Chris Hammond  
Chris Hammond

**CORRECTED FILING RECEIPT**

\*OC00000005034258\*

**UNITED STATES DEPARTMENT OF COMMERCE  
Pat nt and Trademark Office**Address: ASSISTANT SECRETARY AND  
COMMISSIONER OF PATENT AND TRADEMARKS  
Washington, D.C. 20231

APPLICATION NUMBER	FILING DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	DRAWINGS	TOT CLAIMS	IND CLAIMS
09/470,265	12/22/1999	2811	2386	303.455US3	11	67	13

21186

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Date Mailed: 04/06/2000

Receipt is acknowledged of this nonprovisional Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please write to the Office of Initial Patent Examination's Customer Service Center. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the PTO processes the reply to the Notice, the PTO will generate another Filing Receipt incorporating the requested corrections (if appropriate).

**Applicant(s)**

KARL M ROBINSON, BOISE, ID ;

**Continuing Data as Claimed by Applicant**

THIS APPLICATION IS A DIV OF 08/676,708 07/08/1996

**Foreign Applications**

If Required, Foreign Filing License Granted 02/07/2000

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**Title**

DEVICE HAVING IMPROVED CAPACITANCE AND METHODS OF THEIR FABRICATION

**Preliminary Class**

257

Data entry by : SHEFFEY, CATHERINE

Team : OIPE

Date: 04/06/2000

Schwegman, Lundberg,  
Woessner & Kluth, P.A.

APR 13 2000

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## DEVICES HAVING IMPROVED CAPACITANCE AND METHODS OF THEIR FABRICATION

### **Background**

Although there have been attempts to deposit metal oxides, such as  $\text{TiO}_2$  and  $\text{SrTiO}_3$ , during semiconductor fabrication, thermal oxidation of metals in the fabrication of capacitors has been limited since an initial oxide layer prohibits further diffusion during thermal oxidation. As a result the use of high dielectric constant oxidized metals has been limited in semiconductor capacitor fabrication. One such metal, titanium dioxide, has a dielectric constant 2-15 times greater than present semiconductor capacitor dielectrics such as silicon nitride, while titanates are 2-1000 times greater.

In the January 1996 issue of Material Research, Vol. 11, No. 1, an article entitled ELECTROCHEMICAL SYNTHESIS OF BARIUM TITANATE THIN FILMS, R.R. Bacsá et al. describes the synthesizing of polycrystalline films of barium titanate on titanium substrates by the galvanostatic anodization of titanium to form a material which has a dielectric constant of 200.

### **Summary of the Invention**

The invention includes new capacitor structures and dielectrics and methods for forming such capacitors and dielectrics.

In one exemplary embodiment the capacitor of the invention is formed by a process using only two deposition steps. The capacitor has first and second conductive plates and a dielectric is formed from the first conductive plate.